Current Trends in Natural Sciences (on-line) ISSN: 2284-953X ISSN-L: 2284-9521 Current Trends in Natural Sciences (CD-Rom) ISSN: 2284-9521 ISSN-L: 2284-9521

OBSERVATIONS ON THE INVERTEBRATE FAUNA FROM SOME LAVENDER (LAVANDULA SP.) CROPS IN 2023

Stela-Daniela Enache (Troia)¹, Nela Tălmaciu¹, Monica Herea^{1*}, Ionela Mocanu¹, Mihai Tălmaciu¹

¹"Ion Ionescu de la Brad" University of Life Sciences, Mihail Sadoveanu Alley, No 3, 700490, Iasi, Romania

Current Trends in Natural Sciences

Abstract

The observations were made in a lavender culture located in NE Moldova, Romania. In the characterization of the climate in the area of NE Moldova.

To collect the material, were used two types of traps, namely: sticky chromatic traps, and the second one represented by the use of Barber type traps starting from May, until August inclusive.

The analysis of the collected material shows that the collected specimens belong to the Class Hexapoda, with several orders of insects and the Class Arachnida, the order Aranea and the order Acari, but most of them belong to the class Insecta. The orders to which the collected species belong are: Coleoptera, Heteroptera, Hymenoptera, Diptera, Neuroptera, Homoptera, all from the Hexapoda class.

The purpose of the research that was carried out was to determine with as much precision as possible the pests that affect or can affect the lavender crops in the NE part of Moldova, as well as the knowledge of the useful fauna or the possibilities of protecting the insects.

Keywords: arthropods, lavander culture, entomofauna.

1. INTRODUCTION

Lavender, or little lavandula, is a perennial shrub that is part of the Lamiaceae family. It has persistent leaves, usually silver-green in color. The plant has small blue or purple flowers. The narrow leaves are dull and gray in color when young and turn green as they mature (Weiss, 1988).

It reaches maturity in 2–5 years from planting and can have a lifespan of up to 80 years in Europe. Lavender can be grown in pots or directly on the ground. The plants are native to the Mediterranean region, the Arabian Peninsula, Russia, and Africa. In addition, lavender is grown in the United States, the United Kingdom, southern Europe, and Australia (Blumenthal et al, 2000).

Lavender is a perennial plant with a strong fragrance and is among the most well-known aromatic plants. Lavender has been used since ancient times for aromatic and medicinal purposes and maintains popularity due to its compounds in essential oils in the perfume industry and other personal care products. Precious for its perfume as well as for its medicinal properties or for its beautiful color, lavender is a plant appreciated all over the world. It also attracts many species of

Current Trends in Natural Sciences Vol. 13, Issue 25, pp. 162-169, 2024 https://doi.org/10.47068/ctns.2024.v13i25.019

Current Trends in Natural Sciences (on-line) ISSN: 2284-953X ISSN-L: 2284-9521

pollinators to the garden. Cultivated more and more in gardens, lavender bushes represent a point of attraction for nature lovers but also for bees. Moreover, lavender is known to repel mosquitoes and other unwanted insects, so planting near terraces is more than recommended (Denner, 2008).

Lavender can be attacked by various diseases (mildew, gray rot) and pests (aphids, white blowfly), especially in conditions of high humidity in the soil, where favorable conditions are created for their appearance at the level of the root system and the bundle (Milica, 2012).

2. MATERIALS AND METHODS

In order to carry out research on the fauna of medicinal plant crops, the biological material was collected with the help of two methods: yellow sticky traps and Barber-type soil traps (Enache, 2023).

The Barber traps were installed at a distance of approximately 6 m between them, diagonally. In this year of experience, the number of samples collected was 36 for each culture (6 traps x 6 collections). The total number of samples collected was 288 (144 each year).

In 2023, the traps for the collection of entomofauna were set up on May 15, with the first collection taking place on May 30, 2023. In the field, the entomological material was collected at an interval of 10 days, starting in June and ending in August.

After collecting the entomological material, the following operations are performed: field labeling of samples collected on dates, traps, and crops cleaning the collected entomological material and preserving it in the laboratory.

When used in series, these traps can also be used to estimate both species composition (number of species present) and abundance (number of individuals). By placing 10–12 traps, all categories of species can be collected to establish dominance in a biotope, because in the case of a temperate climate, we have two groups: species with large numbers (dominant, constant), and species with small numbers (sporadic). Therefore, the dominant species will always be collected. Through a small number of collections, only the abundant species (eudominant and dominant) will be captured. Through a larger number of samples, both the number of individuals and the collected species will be closer to the real number of herds in nature.

The contents of each trap were put on a sieve to separate the insects from the fixing liquid, and then the contents were stored in plastic containers on which the following information was noted on the label: the resident, the culture, the date of collection, and the trap number. After each collection, the trap was reinserted into the soil and the fixative fluid replaced. The collected material was brought to the laboratory, and the insects were determined and inventoried.







Figure. 1. Placement of traps in the lavender culture a) Soil traps type Barber, b) Sticky chromatic traps, c) lavender field

https://doi.org/10.47068/ctns.2024.v13i25.019

The chromatic sticky traps are designed to attract and capture pests in a harmless way. They consist of sheets or strips coated with a sticky adhesive that captures insects. One of the key features of sticky traps is their color, which is selected based on the specific attraction of different pests.

Sticky traps can be used both for monitoring pests and for their actual control. When the plants are very small, in the seedling phase, the traps are placed at a height of 15-20 centimeters from the ground. As the plants grow and mature, the height of the traps should also be increased, up to 40–60 centimeters above the ground.

Trap control is done once a week, or even every two weeks, to follow the evolution of the insect population (Filipescu, 1993). Traps should be changed when the adhesive layer is excessively covered by insects or according to the specifications on the package.

The determination of the captured material was done with the help of determiners (Raitter and Panin).

From the analysis of the material collected at the 2 traps during the observations, the following groups of insects were found in the culture: wasps, cicadas, aphids, coleoptera, ants, etc.

3. RESULTS AND DISCUSSIONS

In the year 2023, in the lavender culture, with the help of the Barber-type soil traps (Table 1), six harvests were carried out on the following dates: 30.05; 10.06; 24.06; 02.07; 26.07; and 07.08. At the first collection, 341 specimens of invertebrates belonging to the following groups were identified: Arachnida, Homoptera, Hemiptera, Coleoptera, Diptera, Orthoptera, Lepidoptera, and Myriapoda The most representative species were: Coleoptera (127 specimens), mites (46 specimens), and ants (37 specimens).

On June 10, in the lavender culture, 306 specimens of invertebrates belonging to the following groups were collected with the help of Barber soil traps: arachnids, *Coleoptera, Orthoptera, Diptera,* and *Myriapoda*. Of the total species collected, the species cited as harmful, with the highest abundance, is *Harpalus distienguendus*, with 135 specimens collected, which represents 44% of the total.

On June 24, a total of 224 invertebrates were collected in the lavender culture. The most abundant species were: ants (38 specimens), parasitic wasps (24 specimens), and arachnids (21 specimens). These are cited as useful species and represent 37% of the total fauna collected. Among the 8 invertebrate orders collected, the *Coleoptera* order has the most species collected, namely 23, with a total of 73 specimens.

In 2023, on 02.07, total of 328 invertebrate specimens were identified. The most representative species were: *Harpalus distinguendus* (128 specimens), ants (52 specimens), parasitic wasps (32 specimens), shield bugs (17 specimens), etc.

On July 26, in the lavender culture, the total of 550 specimens of invertebrates belonging to the following groups were collected with the help of Barber soil traps: *Coleoptera, Arachnida, Collembola, Diptera, Orthoptera, Myriapoda, Hemipterans, and Hymenoptera.* Of the total species collected, the species cited as harmful, with the highest abundance, is *Harpalus distienguendus*, with 351 specimens collected, which represents 63.8% of the total.

On August 7, 2023, in the lavender culture, a total of 257 invertebrates belonging to the following groups were collected: Arachnida, *Hemiptera, Coleoptera, Orthoptera,* and *Hymenoptera*. The most abundant species were: *Harpalus distinguendus* (117 specimens), *Harpalus pubescens* (16 specimens), *Opatrum sabulosum* (15 specimens), etc. Of the 21 species of *Coleoptera* were collected, a total of 12 species recorded only one specimen.

Current Trends in Natural Sciences Vol. 13, Issue 25, pp. 162-169, 2024 https://doi.org/10.47068/ctns.2024.v13i25.019

Current Trends in Natural Sciences (on-line) ISSN: 2284-953X ISSN-L: 2284-9521 Current Trends in Natural Sciences (CD-Rom) ISSN: 2284-9521 ISSN-L: 2284-9521

Class/	Species/group		No. of trap				Total		
Order		species/group	1	2	3	4	5	6	samples
Arachnida	Acarians		24	20	19	3	18	16	104
Araciiniua	Aranea		13	16	26	21	9	14	99
	1.	Airophilus elongatus		1					1
	2.	Aleochara laevigata	3		1	2		1	7
	З.	Aleochara rufficornis		1	1			1	3
	4.	Amara crenata			3			5	8
	5.	Amara familiaris				2			2
	6.	Antherophagus nigricornis					2		2
	7.	Anthichus cervinus	1		1	2		1	5
	8.	Anthichus humeralis		1			1	1	3
	9.	Anthicus floralis		2		2	2	2	8
	10.	Aphthona euphorbiae	2						2
	11.	Atomaria atricapilla		1				1	2
	12.	Atomaria gutta	2						2
	13.	Brachynus crepitans	_	1	6			4	11
	14.	Calathus ambigus				1		1	2
	15.	Carabus violaceum					-	2	2
	16.	Cartodere elongata	1	-	1	2	2	2	8
	17.	Cartodere longicollis	1	2			1		4
	18.	Cassida azurea		1	1				2
	19.	Coccinella 11 punctata				1	2		3
	20.	Corticaria crenulata				1		1	2
	21.	Corticaria gibbosa			2			1	3
	22.	Cryptophagus dentatus			1	1			2
Coleoptera	23.	Dermestes laniarius	2	6	2	2	l	0	11
	24.	Drasterius bimaculatus	1	13	3	14	6	8	45
	25.	Formicomus pedestris	1	6	1	4	3		15
	20.	Galeruca tanacete				2	1		1
	27.	Harpalus affinis	4	2	1	2			17
	20.	Harpalus calcealus	4	3 124	175	J 107	61	145	752
	29.	Harpalus aistienguenaus	47	124	175	197	04	143	2
	30.	Harpatus niger	0	3	20	22	2	10	97
	31.	Harpalus rufus	0	1	30	22	Z	10	2
	32.	Harpalus smaraadinus	2			1			1
	31	Hydroporus nigrita				1		1	2
	35	Ityochara rubens	2	1	1	1		1	
	36	Limnichus sericeus	2	1	1				1
	37	Longitarsus anchusae	5	2	1		1		9
	38	Longitarsus brunneus	5	2	-		1		3
	30.	Longitarsus bridus		1	3		2		6
	40	Longitarsus lyconi		3	5		1		4
	41	Melanimon tibiale	1				1		1
	42	Metabletus truncatelus						1	1
	43	Opatrum sabulosum	13	16	12	3	8	2	54
	44.	Orchestes fagi				1		-	1
	45	Otiorhynchus pinastri	+			-		2	2
	15.	Chomphennis pindoiri	1		I			-	-

Table 1. Invertebrate fauna collected in lavender culture

*Corresponding author, E-mail address: monica28is@yahoo.com

https://doi.org/10.47068/ctns.2024.v13i25.019

Current Trends in Natural Sciences (on-line) ISSN: 2284-953X ISSN-L: 2284-9521 Current Trends in Natural Sciences (CD-Rom) ISSN: 2284-9521 ISSN-L: 2284-9521

	Species/group		No. of trap					Total samples
			2	3	4	5	6	
	46. Pentodom idiota				1		2	3
	47. Platynus longiventris					1		1
	48. Polydrosus amoenus	2	3	2		2		9
	49. Pterostichus cupreus	6			2		3	11
	50. Pterostichus niger			3	2			5
	51. Pteryngium crenatum		2	4		2	2	10
	52. Rizophagus politus		1					1
	Total coleopters 52 species	coleopters 52 species 1148 samples						
Hemiptera	Cicads	9	8	14	6	8	4	49
	Corythucha ciliata	1	1			1		3
	Stephanitis pyri		1		2	1		4
	Tingis parvula	1						1
	Aphids	22	2	2	10		13	40
Shield bug		9	8	11	7	12	2	63
Collembolla	Colembols		4					4
Myriapoda	Miriapods		1	2	4	1	2	11
Lepidoptera	Butterflies			4	1		4	9
Diptera	Dipters	2	4	5	4		6	21
	Ants	18	33	53	55	28	34	221
Hymenoptera	Bees		4	1		1		6
	Parasitic wasp	25	26	34	19	16	18	142
Orthontors	Gryllus campestris	2	9	6	33	4	8	59
Ormoptera	Grasshopper	3	10	1	1	4	3	22
TOTAL		234	356	431	437	208	345	2006

In the year 2023, in the lavender culture, a total of 71 species or groups of invertebrates totaling 2006 specimens were collected with the help of Barber-type soil traps (Table 1).





https://doi.org/10.47068/ctns.2024.v13i25.019

Current Trends in Natural Sciences (on-line) ISSN: 2284-953X ISSN-L: 2284-9521

The order Coleoptera is the most representative, with 53 species totaling 1148 specimens, with the species Harpalus distinguendus (pest) representing 37.5% of the total invertebrate fauna collected in 2022 (Figure 2).

The research on the invertebrate fauna collected at the yellow traps in the lavender culture aimed at the identification of the taxa, respectively, of the species, which was done with the naked eye or with a binocular magnifying glass.

Six readings were made during the year 2023 on the following dates: 30.05, 10.06, 24.06, 02.07, 26.07, and 07.08. The readings were done periodically, from May to August. Following the centralization of data from the field by tracking the species collected on the chromatic sticky traps, the invertebrates totaled 855 specimens. The species with the most specimens captured are diptera (299 specimens) at 26.8% and ants (161 specimens) at 18.8% of the total specimens (Table 2).

The highest abundance was recorded on August 7, with 217 specimens, and the smallest on June 10, 2023, with 51 copies (Figure 3).

Table 2. Invertebrate fauna col	ected with the help of yellow traps in the lavender	culture in the year 2023

Date of collection	Species/ group of invertebrates	Number of specimens	
	Dipters	32	
	Bees	2	
	Ichneumonids	3	
30.05.2023	Butterflies	5	
	Phyllotreta atra	3	
	Aphids	63	
	Coccinella 7 punctata	3	
	111		
	Meligetes aeneus	2	
	Mordella aculeata	6	
	Loxostage stricticalis	2	
10.06.2022	Dipters	31	
	Bees	6	
	Phylaemus spumarius	2	
	Philanthus triangulum	2	
	TOTAL	51	
	Cicads	58	
	Coccinella 7 punctata	1	
	Ants	53	
24.06.2022	Dipters	27	
24.00.2022	Panorpa communis	5	
	Aphids	31	
	Butterflies	5	
	Phylaemus spumarius	1	
	181		
	Agriotes lineatus	5	
	Vanessa cardui	2	
	Dipters	29	
02.07.2022	Bees	4	
	Cicads	63	
	Micraspis sedecimpunctata	5	
	Philanthus triangulum	7	
TOTAL		115	
	Meligetes aeneus	2	
	Mordella aculeata		
	Ants	58	
	Dipters	43	
27.07.2022	Panorpa communis	5	
	·	167	

http://www.natsci.upit.ro

*Corresponding author, E-mail address: monica28is@yahoo.com

Current Trends in Natural Sciences Vol. 13, Issue 25, pp. 162-169, 2024 https://doi.org/10.47068/ctns.2024.v13i25.019

Current Trends in Natural Sciences (on-line) ISSN: 2284-953X ISSN-L: 2284-9521 Current Trends in Natural Sciences (CD-Rom) ISSN: 2284-9521 ISSN-L: 2284-9521

	Aphids	61
	Butterflies	6
TOTAL		180
07.08.2022	Panorpa communis	8
	Dipters	67
	Anthaxia nitidula	7
	Cicads	82
	Antd	50
	Phylaemus spumarius	1
	Halyomorphahalys	2
TOTAL		855



Figure 3. The abundance of invertebrates collected using yellow traps

4. CONCLUSIONS

The research was carried out on one of the most appreciated and used medicinal plants (*Lavandula angustifolia*) during the year 2023, using Barber-type soil traps and yellow traps as methods. The material was collected from May to August, at intervals of about 12–16 days, with the collected material being labeled, then brought to the laboratory, where it was preserved and then determined by species groups: diptera, hymenoptera, hemiptera, ants, parasitic wasps, miriapods, arachnids, etc. All coleopterans were identified at the species level.

At the yellow traps, from the lavender culture, in 2023, 855 specimens were collected, all belonging to the *Insecta* class. The most specimens (217 specimens) were collected on 07.08, followed by the collection on 24.06 (181 specimens). Among the hexapods collected, cicadas, ants, dipterans, and parasitic wasps had the highest number.

https://doi.org/10.47068/ctns.2024.v13i25.019

Current Trends in Natural Sciences (on-line) ISSN: 2284-953X ISSN-L: 2284-9521 Current Trends in Natural Sciences (CD-Rom) ISSN: 2284-9521 ISSN-L: 2284-9521

5. REFERENCES

- Blumenthal M., Goldberg A. and Brinckmann J. (2000). Herbal medicine: Expanded commission e monographs. *Integrative Medicine Communications*, Newton, 78-83.
- Denner S. S. (2008). Lavandula angustifolia Miller English Lavende, Holistic Nursing Practice 23(1), 57-64.
- Enache Troia S. D., Talmaciu N., Mitrea I., Herea M., Talmaciu M., (2023). Contributions to the knowledge of existing entomofauna in the lavender crops, Annals of the University of Craiova Agriculture, Montanology, Cadastre Series, 53(2), 73-77.
- Filipescu C., Georgescu T., Tălmaciu M., (1993). Entomology of parasitic braconids (*Hymenoptera*), obtained from harmful insect cultures, and their economic importance, *Stientific Working, Horticulture series, IULS*, 36(1), 191-199.
- Milică C., Troia D., Roman C.N., (2012). The medicinal flora of Romania, Publishing house Doxologia, Iasy, 438, ISBN 978-606-8278-12-4.

Weiss R.F. (1988). Herbal medicine. Publishing house AB Arcanum, Gothenburg.